

What is claimed is:

1. A method of processing a wafer, comprising:
5 receiving a wafer having a process side and a back side;
removing un-wanted particles from the back side of the wafer;
thereafter performing a specific processing task on the process side of the
wafer for the first time.
- 10 2. The method as recited in claim 1 wherein the unwanted particles are removed
from the backside of the wafer to prevent gaps from forming between the backside of
the wafer and a chucking surface.
- 15 3. The method as recited in claim 1 wherein the wafer is loaded into a process
chamber after removing the unwanted particles, and wherein the wafer is placed on a
chuck after loading the wafer into the process chamber and before performing the
specific processing task.
- 20 4. The method as recited in claim 1 wherein the un-wanted particles are removed
by cleaning the backside of the wafer in a dry cleaning process, semi-dry cleaning
process or a wet cleaning process, and wherein the specific processing task is selected
from etching, deposition or patterning.
- 25 5. A method of processing a wafer having a process side and a backside opposite
the process side, the method comprising:
providing a cleaning module for cleaning the backside of the wafer and a
processing module for performing a processing task on the process side of the wafer;
receiving a wafer for processing;
30 loading the wafer into the cleaning module;
cleaning the backside of the wafer in the cleaning module to remove particles
therefrom;
transferring the wafer to the processing module;
loading the wafer into the processing module; and

performing the processing task on the process side of the wafer in the processing module.

6. The method as recited in claim 5 wherein the wafer is a raw wafer or a previously process wafer.

7. The method as recited in claim 5 wherein only the backside of the wafer is cleaned in the cleaning module so as not to damage the process side of the wafer.

8. The method as recited in claim 5 wherein the cleaning module is a semi-dry cleaning module.

9. The method as recited in claim 8 wherein cleaning the backside of the wafer in the semi-dry cleaning module comprises:

providing a brush for scrubbing the backside of the wafer and an applicator for delivering a cleaning solution to the backside of the wafer;

positioning the brush against the backside of the wafer;

flowing the cleaning solution between the backside of the wafer and the brush;

and

moving the brush relative to the wafer so as to force particles off the backside of the wafer.

10. The method as recited in claim 9 wherein the cleaning solution is an alcohol based solution or a water based solution, and wherein the abrasiveness of the brush is configured to remove un-wanted particles without altering the backside of the wafer.

11. The method as recited in claim 5 wherein loading the wafer into the processing module comprises:

introducing the wafer into a process chamber of the processing module;

placing the wafer on a chuck disposed in the process chamber; and

holding the backside of the wafer relative to a top surface of the chuck,

wherein the unwanted particles are removed from the backside of the wafer to prevent gaps from forming between the backside of the wafer and the top surface of the chuck.

12. The method as recited in claim 11 wherein the wafer is held by an electrostatic force, a vacuum force, or a mechanical force.

13. The method as recited in claim 11 wherein performing the processing task in the processing module comprises:

providing a heat transfer system inside the chuck; and

distributing a heat transfer gas to the backside of the wafer via the heat transfer system,

wherein the unwanted particles are removed from the backside of the wafer to reduce heat transfer gas backside faults caused by gaps formed between the backside of the wafer and the top surface of the chuck.

14. The method as recited in claim 5 wherein the processing task is selected from etching, deposition or patterning.

15. The method of claim 5 wherein the processing module is a plasma reactor.

16. The method as recited in claim 5 further comprising:

providing a multiple cluster tool having a transport module, a load lock for holding a plurality of incoming and outgoing wafers, and an aligner for aligning the wafer, the transport module being arranged for transferring the wafer between the load lock, the aligner, the processing module and the cleaning module;

loading a plurality of wafers into the load lock before loading the wafer into the cleaning module;

transferring the wafer to the cleaning module;

transferring the wafer to the aligner after cleaning the backside of the wafer in the cleaning module and before transferring the wafer to the processing module;

loading the wafer into the aligner; and

aligning the wafer in the aligner.

17. The method as recited in claim 5 further comprising:

providing an aligner for aligning the wafer inside the cleaning module;

providing a multiple cluster tool having a transport module and a load lock for holding a plurality of incoming and outgoing wafers, the transport module being arranged for transferring the wafer between the load lock, the processing module and the cleaning module;

5 loading a plurality of wafers into the load lock before loading the wafer into the cleaning module;

transferring the wafer to the cleaning module;

aligning the wafer in the cleaning module after the backside of the wafer is cleaned in the cleaning module.

10 18. The method as recited in claim 5 further comprising:

providing a multiple cluster tool having a transport module, a load lock for holding a plurality of incoming and outgoing wafers, and an aligner for aligning the wafer, the transport module being arranged for transferring the wafer between the
15 load lock, the aligner, and the processing module;

transferring the plurality of wafers to the load lock after the backside of each of the wafers is cleaned in the cleaning module;

loading the plurality of wafers into the load lock;

transferring the wafer to the aligner before transferring the wafer to the
20 processing module;

loading the wafer into the aligner; and

aligning the wafer in the aligner.

19. A system for reducing He backside faults when processing a wafer having a
25 process side and a backside opposite the process side, comprising:

a cleaning module for cleaning the backside of the wafer so as to remove unwanted particles therefrom before performing subsequent processing tasks on the process side of the wafer; and

a processing module for performing processing tasks on the process side of the
30 wafer after the un-wanted particles have been removed from the backside of the wafer.

20. The system as recited in claim 19 wherein the cleaning module comprises:
a cleaning chamber;

an applicator for dispensing a cleaning solution on the back side of the wafer;
a brush for scrubbing the back side of the wafer; and
a wafer holder for holding the wafer relative to the brush,
and wherein the processing module comprises:

- 5 a process chamber within which processing takes place; and
a chuck for holding the backside of the wafer relative to a top surface of the
chuck, the chuck including a heat transfer system for controlling the temperature of
the wafer, the heat transfer system being configured for distributing He gas to the
backside of the wafer during processing.

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